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EXAMINER	
GADDY, BENJAMIN E	

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,340	KOVESI ET AL.	
	Examiner	Art Unit	
	Benjamin E. Gaddy	4181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,16-31 and 33-36* is/are rejected.

7)☒ Claim(s) *15 and 32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 July 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/07/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Variable rate audio encoder via scalable coding and enhancement layers."

Claim Objections

1. Claims 15 and 32 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim must depend from other claims only in the alternative. Claims 15 and 32 both depend from 2 claims each, and use the word "and". See MPEP § 608.01(n). Accordingly, the claims 15 and 32 have not been further treated on the merits.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-14, 16-31, and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koh (US 4,949,383) in view of Grill (US 6,370,507).

Consider claims 1, 16, 35, and 36: Koh discloses a method of coding a digital audio signal frame as a binary output sequence **(Abstract)**, in which a maximum number Nmax of coding bits **(see Col. 3, lines 45-55, where Koh discusses the total number of bits available)** is defined for a set of parameters that can be calculated according to the signal frame **(see Col. 3, lines 24-35, where Koh discusses bit allocation for frames)**, which set is composed of a first and of a second subset **(see Col. 3, lines 25-33, where Koh discusses multiple sub-bands)**, the method comprising the following steps: calculating the parameters of the first subset **(see Figure 1 and Col. 3, lines 45-55, where Koh discusses allocating a first set of bits)**, and coding these parameters on a number N0 of coding bits such that N0<Nmax **(see Col. 3, lines 45-50)**; determining an allocation of Nmax-N0 coding bits for the parameters of the second subset **(see Col. 3, lines 50-60, where Koh discusses allocating the remaining bits)**; and ranking the Nmax-N0 coding bits allocated to the parameters of the second subset in a determined order **(see Col. 4, lines 4-15, where Koh discusses allocation based on scale factors)**, in which the allocation and/or the order of ranking of the Nmax-N0 coding bits is determined as a function of the coded parameters of the first subset **(see Col. 4, lines 5-14, where Koh discusses allocation of bit groups to sub-bands in reference to scaling factors)**, the method furthermore comprising the following steps in response to the indication of a number N of bits of the binary output sequence that are available for the coding of said set of parameters, with N0<N<=Nmax: selecting the second subset's parameters to which are allocated the N-N0 coding bits ranked first in said order **(see Col. 3, lines 35-45, where Koh discusses coding further subbands)**; calculating the selected parameters of the second subset, and coding these parameters so as to produce said N-N0 coding bits ranked first **(see Col. 3, lines 34-55, where Koh discusses**

allocating bits); and inserting into the output sequence the N0 coding bits of the first subset as well as the N-N0 coding bits of the selected parameters of the second subset **(see Figure 1, and Col. 3, lines 30-35, where Koh shows and discusses a multiplexer)**.

With respect to claims 16 and 36, Koh does not specifically disclose a decoder, however the decoder is the obvious inverse of the encoder and one of ordinary skill in the art at the time the invention was made would have realized the obvious need for a decoder which performed the inverse calculations of the encoder in order to generate a signal **(see, for instance, Bruekers (US 6,269,338) "It will be clear that the decoder in the data expansion apparatus should be the inverse of the encoder." See Col. 5, lines 5-10)**.

Koh does not specifically disclose an enhancement layer, however Grill discloses an enhancement layer **(see Figure 1 and, for example, Col. 5, lines 5-13, where Grill discusses a second bitstream dependent of the first for coding)**. It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Koh, and use an enhancement layer as taught by Grill, thus providing coding and decoding without the use of upsampling filters, as discussed by Grill **(see Col. 2, lines 22-37)**.

Consider claims 2 and 17: Koh discloses order of ranking of the coding bits allocated to the parameters of the second subset is variable from one frame to another **(see Col. 6, lines 8-24, where Koh discusses bit allocation)**.

Consider claims 3 and 18: Koh discloses N<Nmax **(see Figure 1, where Koh shows optionally several coding several subbands, therefore unused bits after a first pass)**.

Consider claims 4 and 19: Koh discloses the order of ranking of the coding bits allocated to the parameters of the second subset is an order of decreasing importance determined as a function of at least the coded parameters of the first subset **(see Col. 6, lines 10-20, where Koh discusses descending order)**.

Consider claims 5 and 20: Koh as modified by Grill discloses the order of ranking of the coding bits allocated to the parameters of the second subset is determined with the aid of at least one psychoacoustic criterion as a function of the coded parameters of the first subset **(see Grill, Abstract)**.

Consider claims 6 and 21. Koh as modified by Grill discloses the parameters of the second subset pertain to spectral bands of the signal, in which a spectral envelope of the coded signal is estimated on the basis of the coded parameters of the first subset, in which a curve of frequency masking is calculated by applying an auditory perception model to the estimated spectral envelope, and in which the psychoacoustic criterion makes reference to the level of the estimated spectral envelope with respect to the masking curve in each spectral band. **(see, e.g. Koh, figures 1 and 2, and Grill, figures 1 and 2, where the references show filtering by frequency band, spectral envelopes, perception models, and the use of psychoacoustic criterion)**

Consider claim 7: Koh discloses Nmax=N **(see Col. 3, lines 30-35, where Koh shows optionally utilizing the entire band)**.

Consider claim 8: Koh as modified by Grill discloses the coding bits are ordered in the output sequence in such a way that the N0 coding bits of the first subset precede the N-N0

coding bits of the selected parameters of the second subset and that the respective coding bits of the selected parameters of the second subset appear therein in the order determined for said coding bits **(see, e.g. Grill, figure 1, where Grill shows a multiplexer)**.

Consider claims 9 and 33: Koh discloses the number N varies from one frame to another **(see Col. 6, lines 8-24, where Koh discusses bit allocation)**.

Consider claims 10 and 34: Koh discloses the coding of the parameters of the first subset is at variable bit rate, thereby varying the number N0 from one frame to another **(see Col. 5, lines 5-15, where Koh discusses scaling)**.

Consider claims 11 and 24: Koh and Grill disclose the first subset comprises parameters calculated by a coder kernel **(see, e.g. Figure 1 of Grill, where Grill shows a base layer)**.

Consider claims 12 and 25: Koh and Grill disclose the coder kernel has a lower frequency band of operation than the bandwidth of the signal to be coded, and in which the first subset furthermore comprises energy levels of the audio signal that are associated with frequency bands higher than the operating band of the coder kernel **(see Figure 1 of Grill and Figure 1 of Koh, where Grill and Koh show using separate frequency bands and the coding thereof)**.

Consider claims 13 and 26: The combination of the above discloses the coding bits of the first subset are ordered in the output sequence in such a way that the coding bits of the parameters calculated by the coder kernel are immediately followed by the coding bits of the energy levels associated with the higher frequency bands.

Consider claims 14 and 29: Koh and Grill disclose a signal of difference between the signal to be coded and a synthesis signal derived from the coded parameters produced by the coder kernel is estimated, and in which the first subset furthermore comprises energy levels of the difference signal that are associated with frequency bands included in the operating band of the coder kernel **(see Figure 1 of Koh and Figure 1 of Grill, where Koh and Grill show a difference operator and energy levels)**.

Consider claim 22: Koh as modified by Grill discloses the N0 coding bits of the parameters of the first subset are extracted from the N' bits received at positions of the sequence which precede the positions from which are extracted the N'-N0 coding bits of the selected parameters of the second subset **(see Grill, figures 2 and 3, where Grill shows demultiplexing and decoding)**.

Consider claim 23: Koh as modified by Grill discloses nonselected parameters of the second subset are estimated by interpolation on the basis of at least selected parameters recovered on the basis of said N'-N0 coding bits extracted **(see Col. 10, lines 33-43, where Grill discusses filtering)**.

Consider claim 27: The combination of the above discloses if the N' bits of the input sequence are limited to the coding bits of the input parameters of the decoder kernel and to part at least of the coding bits of the energy levels associated with the higher frequency bands: extracting from the input sequence the coding bits of the input parameters of the decoder kernel and said part of the coding bits of the energy levels; synthesizing a base signal in the decoder kernel and recovering energy levels associated with the higher frequency bands on the basis of

said extracted coding bits; calculating a spectrum of the base signal; assigning an energy level to each higher band with which is associated an uncoded energy level in the input sequence; synthesizing spectral components for each higher frequency band on the basis of the corresponding energy level and of the spectrum of the base signal in at least one band of said spectrum; applying a transformation into the time domain to the synthesized spectral components so as to obtain a base signal correction signal; and adding together the base signal and the correction signal so as to synthesize the signal frame.

Consider claim 28: The combination of the above discloses the energy level assigned to a higher band with which is associated an uncoded energy level in the input sequence is a fraction of a perceptual masking level calculated in accordance with the spectrum of the base signal and the energy levels recovered on the basis of the extracted coding bits.

Consider claim 30: Koh as modified by Grill discloses for N0<N'<Nmax, unselected parameters of the second subset that pertain to spectral components in frequency bands are estimated with the aid of a calculated spectrum of the base signal and/or selected parameters recovered on the basis of said N'<N0 coding bits extracted **(see Grill, figures 2 and 3, where Grill shows demultiplexing and decoding on the basis of a base signal)**.

Consider claim 31: Koh as modified by Grill discloses the unselected parameters of the second subset in a frequency band are estimated with the aid of a spectral neighborhood of said band, which neighborhood is determined on the basis of the N' coding bits of the input sequence **(see Grill, figures 2 and 3, where Grill shows demultiplexing and decoding on the basis of a base signal)**.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin E. Gaddy whose telephone number is (571) 270-5134. The examiner can normally be reached on M-TH 9am - 4pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7876. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Benjamin E. Gaddy /

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Examiner, Art Unit 2626

2/26/08

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